IN THE CLAIMS:

Please cancel claims 1 to 30, 32, 33, 39, 44, 50, 53, 74, 75, 77, 81 and 84 without prejudice. Please amend the claims and add new claims as indicated on the following listing of claims:

1.-30. (Cancelled)

31. (Currently Amended) A method of treating a subject having, or at risk of having, ~~a disorder treatable by producing insulin in a mucosal tissue,~~ diabetes comprising contacting gut or gastrointestinal mucosal tissue endocrine cells in the subject transformed with a polynucleotide comprising ~~gut endocrine~~ a glucose-dependent insulinotropic polypeptide (GIP) promoter or chromogranin A promoter in operable linkage with a nucleic acid encoding insulin, with an amount of sugar, ~~carbohydrate, starch,~~ polypeptide, amino acid or fat that induces production of the insulin by the transformed gut or gastrointestinal mucosal tissue endocrine cells in an amount effective to ~~treat the disorder~~ decrease blood glucose, wherein the endocrine cell transformation occurs *in vivo* via intra-cavity delivery.

32.-33. (Cancelled)

34. (Currently Amended) The method of claim [[33]] 31, wherein the diabetes comprises type [[I]] 1 diabetes.

35. (Previously Presented) The method of claim 31, wherein the subject has a fasting plasma glucose level greater than 110 mg/dl.

36. (Currently Amended) The method of claim [[33]] 31, wherein the diabetes comprises insulin-independent (type 2) diabetes.

37. (Cancelled)

38. (Currently Amended) The method of claim 31, wherein the sugar, ~~carbohydrate, starch,~~ polypeptide, amino acid or fat increases expression or secretion of the insulin.

39. (Cancelled)

40. (Previously Presented) The method of claim 38, wherein secretion of the insulin is increased in endocrine cells.

41.-42. (Cancelled)

43. (Currently Amended) The method of claim 31, wherein the ~~gut endocrine~~ glucose-dependent insulinotropic polypeptide (GIP) promoter or chromogranin A promoter comprises a functional variant or a functional subsequence thereof, and wherein the ~~gut endocrine~~ glucose-dependent insulinotropic polypeptide (GIP) promoter or chromogranin A promoter functional variant or subsequence retains all or a part of non-variant or full-length ~~gut endocrine~~ glucose-dependent insulinotropic polypeptide (GIP) promoter or chromogranin A promoter expression function.

44.-46. (Cancelled)

47. (Currently Amended) The method of claim 31, wherein the gut or gastrointestinal tissue mucosal tissue endocrine cell is present in a tissue or organ of the gastrointestinal tract of a subject.

48. (Previously Presented) The method of claim 47, wherein the tissue is the intestine.

49. (Previously Presented) The method of claim 47, wherein the tissue is the gut.

50. (Cancelled)

51. (Currently Amended) The method of claim [[50]] 31, wherein the mucosal tissue endocrine cell is a K-cell, L-cell, S-cell, G-cell, D-cell, I-cell, Mo-cell, GR cell or entero-endocrine cell.

52. (Currently Amended) The method of claim [[50]] 31, wherein the mucosal tissue endocrine cell is a progeny of a stem cell, a pluripotent progenitor cell or a multipotent progenitor cell.

53. (Cancelled)

54. (Currently Amended) The method of claim 31, wherein the ~~gut endocrine~~ glucose-dependent insulinotropic polypeptide (GIP) promoter or chromogranin A promoter in operable linkage with a nucleic acid further comprises a vector.

55. (Previously Presented) The method of claim 54, wherein the vector comprises a viral vector.

56–70. (Cancelled)

71. (Currently Amended) A method of treating a subject having, or at risk of having, ~~a disorder treatable by producing leptin in a mucosal tissue,~~ undesirable body mass or obesity comprising contacting gut or gastrointestinal mucosal tissue endocrine cells in the subject transformed with a polynucleotide comprising a ~~gut endocrine~~ glucose-dependent

insulinotropic polypeptide (GIP) promoter or chromogranin A promoter in operable linkage with a nucleic acid encoding leptin, with an amount of sugar, ~~carbohydrate, starch,~~ polypeptide, amino acid or fat that induces production of the leptin by the transformed gut or gastrointestinal mucosal tissue endocrine cells in an amount effective to treat ~~the disorder~~ undesirable body mass or obesity, wherein the endocrine cell transformation occurs *in vivo* via intra-cavity delivery.

72. (Currently Amended) The method of claim 71, wherein the ~~disorder comprises~~ undesirable body mass or obesity is reduced ~~or an undesirable body mass~~.

73. (Currently Amended) The method of claim 71, wherein the sugar, ~~carbohydrate, starch,~~ polypeptide, amino acid or fat increases expression or secretion of the leptin.

74-75. (Cancelled)

76. (Currently Amended) The method of claim 71, wherein the ~~gut endocrine~~ glucose-dependent insulinotropic polypeptide (GIP) promoter or chromogranin A promoter comprises a functional variant or functional subsequence thereof that retains all or a part of non-variant or full-length ~~gut endocrine~~ glucose-dependent insulinotropic polypeptide (GIP) promoter or chromogranin A promoter expression function.

77. (Cancelled)

78. (Currently Amended) The method of claim 71, wherein the gut or gastrointestinal mucosal tissue endocrine cell is present in a tissue or organ of the gastrointestinal tract of a subject.

79. (Previously Presented) The method of claim 78, wherein the tissue is the intestine.

80. (Previously Presented) The method of claim 78, wherein the tissue is the gut.

81. (Cancelled)

82. (Currently Amended) The method of claim [[81]] 71, wherein the mucosal tissue endocrine cell is a K-cell, L-cell, S-cell, G-cell, D-cell, I-cell, Mo-cell, GR cell or entero-endocrine cell.

83. (Currently Amended) The method of claim [[81]] 71, wherein the mucosal tissue endocrine cell is a progeny of a stem cell, a pluripotent progenitor cell or a multipotent progenitor cell.

84. (Cancelled)

85. (Currently Amended) The method of claim 71, wherein the ~~gut endocrine~~ glucose-dependent insulinotropic polypeptide (GIP) promoter or chromogranin A promoter in operable linkage with a nucleic acid further comprises a vector.

86. (Previously Presented) The method of claim 85, wherein the vector comprises a viral vector.

87. (New) The method of claim 31, wherein the transformation via intra-cavity delivery is with an endoscope, feeding tube, cannula, intubation tube, or catheter.

88. (New) The method of claim 71, wherein the transformation via intra-cavity delivery is with an endoscope, feeding tube, cannula, intubation tube, or catheter.

89. (New) A method of treating a subject having, or at risk of having, diabetes comprising:
(a) transforming a gut or gastrointestinal mucosal tissue endocrine cell *in vitro* with a polynucleotide comprising a glucose-dependent insulinotropic polypeptide (GIP) promoter or chromagranin A promoter in operable linkage with a nucleic acid encoding insulin;
(b) identifying a cell transformant that produces insulin in response to sugar, polypeptide, amino acid or fat; and
(c) implanting the cell transformant into a tissue or organ of the subject in an amount effective to decrease blood glucose.

90. (New) The method of claim 89 , wherein the diabetes comprises type 1 diabetes.

91. (New) The method of claim 89, wherein the subject has a fasting plasma glucose level greater than 110 mg/dl.

92. (New) The method of claim 89, wherein the diabetes comprises insulin-independent (type 2) diabetes.

93. (New) The method of claim 89, wherein the sugar, polypeptide, amino acid or fat increases expression or secretion of the insulin.

94. (New) The method of claim 89, wherein secretion of the insulin is increased in endocrine cells.

95. (New) The method of claim 89, wherein the glucose-dependent insulinotropic polypeptide (GIP) promoter or chromogranin A promoter comprises a functional variant or a functional subsequence thereof, and wherein the glucose-dependent insulinotropic polypeptide (GIP) promoter or chromogranin A promoter functional variant or

subsequence retains all or a part of non-variant or full-length glucose-dependent insulinotropic polypeptide (GIP) promoter or chromogranin A promoter expression function.

96. (New) The method of claim 89, wherein the gut or gastrointestinal mucosal tissue endocrine cell is implanted in a tissue of the subject.

97. (New) The method of claim 96, wherein the tissue is the intestine.

98. (New) The method of claim 96, wherein the tissue is the gut.

99. (New) The method of claim 89, wherein the mucosal tissue endocrine cell is a K-cell, L-cell, S-cell, G-cell, D-cell, I-cell, Mo-cell, GR cell or entero-endocrine cell.

100. (New) The method of claim 89, wherein the mucosal tissue endocrine cell is a progeny of a stem cell, a pluripotent progenitor cell or a multipotent progenitor cell.

101. (New) The method of claim 89, wherein the glucose-dependent insulinotropic polypeptide (GIP) promoter or chromogranin A promoter in operable linkage with the nucleic acid further comprises a vector.

102. (New) The method of claim 101, wherein the vector comprises a viral vector.

103. (New) A method of treating a subject having, or at risk of having, undesirable body mass or obesity comprising:

(a) transforming a gut or gastrointestinal mucosal tissue endocrine cell *in vitro* with a polynucleotide comprising a glucose-dependent insulinotropic polypeptide (GIP) promoter or chromogranin A promoter in operable linkage with a nucleic acid encoding leptin;

(b) identifying a cell transformant that produces leptin in response to sugar, polypeptide, amino acid or fat; and

(c) implanting the cell transformant into a tissue or organ of the subject in an amount effective to treat undesirable body mass or obesity.

104. (New) The method of claim 103, wherein the undesirable body mass or obesity is reduced.

105. (New) The method of claim 103, wherein the sugar, polypeptide, amino acid or fat increases expression or secretion of the leptin.

106. (New) The method of claim 103, wherein the glucose-dependent insulinotropic polypeptide (GIP) promoter or chromogranin A promoter comprises a functional variant

or functional subsequence thereof that retains all or a part of non-variant or full-length glucose-dependent insulinotropic polypeptide (GIP) promoter or chromogranin A promoter expression function.

107. (New) The method of claim 103, wherein the gut or gastrointestinal mucosal tissue endocrine cell is implanted in a tissue of the subject.

108. (New) The method of claim 107, wherein the tissue is the intestine.

109. (New) The method of claim 107, wherein the tissue is the gut.

110. (New) The method of claim 103, wherein the mucosal tissue endocrine cell is a K-cell, L-cell, S-cell, G-cell, D-cell, I-cell, Mo-cell, GR cell or entero-endocrine cell.

111. (New) The method of claim 103, wherein the mucosal tissue endocrine cell is a progeny of a stem cell, a pluripotent progenitor cell or a multipotent progenitor cell.

112. (New) The method of claim 103, wherein the glucose-dependent insulinotropic polypeptide (GIP) promoter or chromogranin A promoter in operable linkage with the nucleic acid further comprises a vector.

113. (New) The method of claim 112, wherein the vector comprises a viral vector.